Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

TITLE V (DRAFT) NO. V-05-075
A.O. Smith Electrical Products Company - Mount Sterling
Mount Sterling. Kentucky
FEBRUARY 15, 2006
PREPARED BY KENVIRONS, INC.
REVIEWED BY RALPH E. GOSNEY

SOURCE I.D. #:	021-173-00009
SOURCE A.I. #:	3176
ACTIVITY #:	APE20040001

SOURCE DESCRIPTION:
A.O. Smith Electrical Products Company, located in Mount Sterling, Kentucky, is a manufacturer of electrical motor and generator components. Steel coils are received by the facility. They are uncoiled and cut into steel sheets by a slitter. These steel sheets are then pressed into the shape of a rotor and stator steel laminations for the electrical motor. The center of the cut steel is used for the rotor and the outside on the cut steel is used for the stator. The laminations are put into cradles on trays and are conveyed to the heat treating furnaces. The rotor laminations pass through the bluing furnace and the stator laminations pass first through the annealing furnace and then the bluing furnace. The stator laminations that pass through the anneal #3 furnace do not enter a separate bluing furnace because a bluing section is incorporated into the back of this annealing furnace. In order to create a reducing atmosphere and decarbonize the steel, carbon monoxide generators are attached directly to each bluing and annealing furnace. The carbon monoxide generators are separate units, however they only operate when the furnace they are connected to operates. When the entrance to the bluing and annealing furnace opens to allow more laminations into the furnace, a flame curtain is used to maintain the inside atmosphere by not allowing excess air into the furnace.

After passing through their respective furnaces, the laminations are cooled, packed, and then shipped to other A.O. Smith Electrical Products facilities for assembly. The stator laminations that remain at the facility are bolted to hold them together to form the stator core.

After heat treating the rotor laminations, they are sent to other plants where they are stacked together and injected with molten aluminum to form the rotor of the motor. Once the rotors and the stators are made, they are shipped together as a hermetic rotor-stator kit to the customer, who uses these parts for compressors and pumps.

DAQ acknowledges receipt on December 23, 2003, of a renewal Title V air quality permit application for the A.O. Smith Electrical Products, Mount Sterling facility. This represents the first renewal of the Title V air permit. The permit history is summarized as follows:

Rev #	Permit type	Log or Activity#	Complete Date	Issuance Date	Summary of Action
----	Initial Issuance	F509	03/12/98	06/25/99	
1	Administrative revision	I1833	03/20/01	--	Administrative Revision to Emission Units
2	Permit Renewal w/ Revisions	56219	02/22/04	--	Title V Renewal

The renewal Title V application was deemed complete on February 22, 2004 (60 days after receiving the application).

The facility is classified as a Title V major source of air pollution, based on it's potential to emit more than 100 tons per year of carbon monoxide and volatile organic compounds (VOC).

A.O. Smith has applied for renewal of the initial Title V permit incorporating minor modifications to the facility. On January 14, 2000, the facility submitted administrative revisions to the initial permit. The revisions included corrections to the description and construction date of EP 05(05), and the inclusion of EP 29(19) into EP 27(16). On December 19, 2003 the application for renewal of the Title V permit was submitted with minor revisions to the permit: 1) Three Insignificant Activities were permanently removed from the facility. The removed sources are the 1.35 mmBtu/hr Iron Fireman Boiler, the Small motor winding line (including the varnish dipping process), and the Back-up CO Generator: Sunbeam (F-17-71-M). 2) The use of propane as a back-up fuel for the Heat Treating Furnaces was discontinued in 1999. 3) The Lamination Stamping Process was added to the Title V Permit due to the emission of fugitive VOC from the evaporation of the die lubricant.

The following is a list of significant emission units:

EP 02 (02, 08)	Steam Blue #1 and Main CO Generator, consists of the Steam Blue #1 Heat Treating Furnace (3.24 mmBtu/hr) and the Main CO Generator (2.7 mmBtu/hr). The Main CO Generator is shared with Steam Blue #2 Heat Treating Furnace.
EP 03 (03)	Anneal #1 and CO Generator, consists of Anneal #1 Heat Treating Furnace (4.88 mmBtu/hr) and Anneal #1 CO Generator (1.2 mmBtu/hr).
EP 04 (04)	Anneal #2 and CO Generator, consists of Anneal #2 Heat Treating Furnace (4.88 mmBtu/hr) and Anneal #2 CO Generator (1.2 mmBtu/hr).
EP 05 (05)	Anneal #3 and CO Generator, consists of Anneal #3 Heat Treating Furnace (6.73 mmBtu/hr) and Anneal #3 CO Generator (1.48 mmBtu/hr).
EP 06 (06, 08)	Steam Blue #2 and Main CO Generator, consists of Steam Blue #2 Heat Treating Furnace (3.35 mmBtu/hr) and Main CO Generator (2.7 mmBtu/hr). The Main CO Generator is shared with Steam Blue #1 Heat Treating Furnace.
EP 27 (16)	Steam Blue Anneal #4, consists of Anneal #4 Heat Treating Furnace (13.86 mmBtu/hr) and Anneal #4 Steam Blue Zone (1.1 mmBtu/hr).
EP 30 (20)	Lamination Stamping Process, consists of 13 progressive die stamping presses and 1 scroll stamping press. The emissions from this unit are fugitive VOCs released from the evaporation of the die lubricant.

The source is subject to:

1. Regulation 401 KAR 61:020 *Existing process operations*
2. Regulation 401 KAR 59:010 *New process operations*
3. Regulation 401 KAR 59:015 *Indirect heat exchangers* (Insignificant Activities)
4. Regulation 401 KAR 61:015 *New indirect heat exchangers* (Insignificant Activities)

Applicable requirements specific to each emission unit are listed as follows:

EP 02 (02, 08) Steam Blue #1 Heat Treating Furnace and Main CO Generator:
EP 03 (03) Anneal #1 Heat Treating Furnace and Anneal #1 CO Generator:
EP 04 (04) Anneal #2 Heat Treating Furnace and Anneal #2 CO Generator:
EP 05 (05) Steam Blue Anneal #3 Heat Treating Furnace and Steam Blue Anneal #3 CO Generator:
EP 06 (06, 08) Steam Blue #2 Heat Treating Furnace and Main CO Generator:

The above listed emission units are subject to 401 KAR 61:020, *Existing process operations constructed prior to July 2, 1975* limiting particulate and visible emissions from Steel Lamination processing and combustion of natural gas by both the furnaces and generators. Compliance assurance with the particulate limitation shall be demonstrated via tracking the facilities' natural gas usage rates, emission factors, and calculating allowable and actual emissions. To determine compliance with opacity limits, A.O. Smith shall be required to perform daily visible emission observations and Method 9 reading if visible emissions are observed.

EP 27 (16) Steam Blue Anneal #4 Heat Treating Furnace:

401 KAR 59:010, *New process operations constructed on or after July 2, 1975* applies to particulate and visible emissions from Steel Lamination processing and combustion of natural gas by the furnace. Compliance assurance with the particulate limitation shall be demonstrated via tracking the facilities' natural gas usage rates, emission factors, and calculating allowable and actual emissions. To determine compliance with opacity limits, A.O. Smith shall be required to perform daily visible emission observations and Method 9 reading if visible emissions are observed.

EP 30 (20) Lamination Stamping Process:

401 KAR 50:012, General application applies to VOC emissions at a major source as there are no other standards applicable to VOC emissions.

Non-Applicable Regulations:

a. EP 02, 03, 04, 05, 06, 27
   i. 401 KAR 59:015 *New Indirect Heat Exchangers constructed on or after April 9, 1972*. The annealing and bluing furnaces do not meet the definition in Section 2(2). Specifically, the medium through which the energy of combustion is transmitted to its point of usage does come into contact with the products of combustion.
   ii. 401 KAR 61:015 *Existing Indirect Heat Exchangers constructed prior to April 9, 1972*. The annealing and bluing furnaces do not meet the definition in Section 2(2). Specifically, the medium through which the energy of combustion is transmitted to

its point of usage does come into contact with the products of combustion.

iii. 40 CFR 60 Subpart D, *Standards of Performance for Fossil-Fuel-Fired Steam Generators for Which Construction was Commenced After August 17, 1971*. The annealing and bluing furnaces and CO Generators do not meet the definition for a fossil-fuel fired steam generating unit.

iv. 401 KAR 51:017, Prevention of Significant Deterioration of Air Quality, does not apply to sources of CO emissions since the affected sources, except for EP 27 (26), were constructed prior to 1970.

v. 40 CFR 60 Subpart Da, *Standards of Performance for Electric Utility Generators for Which Construction was Commenced After September 18, 1978*. The annealing and bluing furnaces and CO Generators are not used in the capacity of generating electricity.

vi. 40 CFR 60 Subpart Db, *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units*. The annealing and bluing furnaces and CO Generators do not meet the definition for an electric utility steam generating unit.

vii. 40 CFR 60 Subpart Dc—*Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*. The annealing and bluing furnaces and CO Generators do not meet the definition for a steam generating unit.

viii. 40 CFR 63 Subpart DDDDD, *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters* does not apply to any of the combustion units at the facility. A.O. Smith is not a major source of Hazardous Air Pollutants.

ix. 40 CFR 64 Compliance Assurance Monitoring (CAM). Not applicable since no control devices are employed to meet an applicable emission limit.

b. EP 30

i. 401 KAR 61:060, *Existing sources using organic solvents*, does not apply to the Lamination Stamping Process since the source was constructed prior to April 9, 1972 and is located in a Priority III Region for photochemical oxidants.

ii. 40 CFR 64 Compliance Assurance Monitoring (CAM). Not applicable since no control devices are employed to meet an applicable emission limit.

COMMENTS:

Types of control:

Reasonable, Available and Practical control procedure is required pursuant to 401 KAR 50:012, General applications. The permittee has six months time from the issuance of the final permit to submit a proposal and get an approval from the Division.

Emission factors:
AP-42 Section 1.4 (Natural Gas Combustion) emission factors were used to calculate emissions from the combustion units at the facility.

Best engineering judgment was used to adjust the CO emission factor from SCC 10300603 for the CO generators due to the oxygen-starved atmosphere resulting in incomplete combustion.

The CO emission factor for the CO generators was calculated as follows:

1. [Exogas %CO/(13.8 cf CO / #CO)] x 1,000,000 CF / mmCF x (Exogas mmcf / natural gas mmCF conversion factor).
2. Normal ("actual") air/ gas ration setting = 6.7:1; 6.6:1 used for MTE; 6.4:1 used for PTE.
3. Exogas mmCF / natural gas mmCF conversion factor was calculated as such: CFH (exogas) = [CFH(air) + CFH(gas)] x 0.9

The VOC emission factor for the Lamination Stamping Process provided by the plant was derived from an emissions study performed on November 2003. This factor assumes 58.9% of the solvent is emitted. Due to the lack of supporting documentation regarding the testing methodology, the Division has calculated potential VOC emissions from the Lamination Stamping Process assuming all solvent is emitted as VOC. Potential VOC emissions form the Lamination Stamping Process calculated in this manner are 210.6 tons per year. Source specific testing is required with the issuance of this permit to calculate the VOC emissions. The solvent contains no HAP.

EMISSION AND OPERATING CAPS DESCRIPTION:

NA

PERIODIC MONITORING:

The affective facilities subject to 401 KAR 59:010 or 61:020 emit PM from only the combustion of natural gas. Therefore, the compliance with the opacity limit is demonstrated while burning natural gas, and emissions can be easily and accurately estimated using well established emission factors and tracking the facilities' natural gas usage rates.

OPERATIONAL FLEXIBILITY:

NA

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.